# Additional Things to Know for Expt. 10 - Chem 1B

How many students per group? Let's check the number of working pH meters in the lab that day. At least 2 students per group, but if we don't have enough pH meters, there can be 3 or 4 per group.
***We will be starting this experiment pretty early – maybe 6:30 or 7:00 pm – so please plan accordingly. Be here and have your prelab ready before class.***

**Part 1**

- Be careful and do this quantitatively. Don't spill any of the solid. Don't use a scoopula or other implement, because some solid particles will stick to it.
- Avoid large chunks of the unknown weak acid if possible.
- When mixing, use Parafilm to seal the top of the flask. If you don't know how to use it, ask.

**Part 2**

- Titrate into a flask.
- Be very careful near the endpoint – try not to miss it!
- We're trying to find the volume of base needed to reach the endpoint. This will be approximate.
- Write down the molarity of the NaOH solution.

**Part 3**

- Titrate into a **beaker**, not a flask. (If you don't know the difference, please ask.)
- **Before starting, adjust the initial volume in the buret to 0.00 mL.** Normally we have no reason to do this, but in this case, since we're taking so many buret readings, it's worth the effort to start at 0.00 mL. If you don't, you will have MANY subtractions to make with your data.
- Record the initial pH. Leave the pH meter probe in the solution throughout the entire titration. Each time you take a reading, you will read the volume and the pH. (2 decimal places for each one.)
- Do not add any water to your solution as you titrate it!
- It is vitally important that you take lots of pH readings. You need closely-spaced readings anywhere the pH is changing rapidly (especially near the equivalence point), and fewer readings where pH is changing slowly.
- If you don't take enough readings near the endpoint, your graph and your data will be **useless**! Please be careful.

**After the experiment**

Make 3 graphs. Use Excel, otherwise it's just too much work.

1. Titration curve, including all of the data (don't include a trendline, just show the points)
2. Close-up graph near the equivalence point. Goal: to precisely determine the V and pH of the equivalence point.
3. Close-up graph of the area near the halfway point. (Insert a linear trendline.) The goal here is to use the volume at the halfway point and estimate from the graph the precise pH at this point. You will use this to determine the $K_a$.

Make sure to **do ALL of the calculations and questions on page 48**. This will take a while, so plan your time accordingly.

Note: to find molar mass, divide the number of grams by the number of moles. But watch out: these must be for the same sized sample. You can either choose the sample size as the entire 100.0 mL of the solution OR the 25.00 mL used for a single titration. However, don't use the moles from 25.00 mL with the mass of the entire 100.0 mL sample – these are not the same sample size, and this will NOT give you the correct molar mass.

**Summary of results:** Include the unknown number, the $K_a$, and the molar mass.

**Evaluation of results:**

- As usual, discuss 3 or 4 sources of error in detail. For each one, explain whether it would make your final results higher or lower and explain why.
- For this experiment, for each source of error, explain whether that error would make $K_a$ higher or lower, and whether it would make the calculated molar mass higher or lower. Make sure your explanation is complete and clear.
- I'll be checking to see that your logic is clear and correct and that you've thought about it carefully. Vague answers will lose points.